

C2.2b Permanent non-tidal, fast, turbulent watercourse of plains and montane regions with *Ranunculus* spp.

Summary

The habitat includes river stretches with a stoney, gravelly or shingly river bed with an average fast but variable flow, and alternating periods of low water level and floods. This regime promotes a cyclic development of the vegetation, the coexistence of various microhabitats and self-purification due to the high oxygen level. It occurs throughout Europe though is scarcer towards the south. Typically there are patches of bare stoney bed, of aquatic mosses attached to stones and of submerged rooting macrophytes. Emergents and amphibious plants occur in shallow and periodically emergent margins. Human-induced changes in the hydrology and water pollution are the main threats. The habitat needs strict protection mostly related to maintain natural hydrological conditions, vigilance of water quality, and control of sand and gravel extraction, forest plantation and fishing. Restoration of artificialized watercourses, recovery of degraded water quality and the management of urban and industrial waste is needed.

Synthesis

The habitat is Vulnerable (VU) because of a recent decrease in quantity of 44%. Besides, a substantial reduction in quality occurred, with values at the boundary between Near Threatened and Vulnerable (63% of the extent, 49% severity).

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1	Vulnerable	A1

Sub-habitat types that may require further examination

This habitat type could be locally more threatened in the most arid part of Europe and in regions where it is not abundant due to geomorphological conditions.

Habitat Type

Code and name

C2.2b Permanent non-tidal, fast, turbulent watercourse of plains and montane regions with *Ranunculus* spp.



Ranunculus fluitans-dominated community, River Navia, stretch near Cacabellos (Asturias), Spain (Photo: Jose Antonio Molina).



Ranunculus aquatilis in a rapid running brook in the eastern part of the Ardennes, Belgium (Photo: John Janssen).

Habitat description

The habitat includes river stretches with a stony, gravelly or shingly river bed with an average flow velocity over 0.2 m/sec. Main physical differences between this habitat type and C2.3 (Permanent non-tidal, smooth-flowing watercourses) are the higher flow velocity and the bigger grain size of the sediments. These two habitats, as well as the habitat C2.2a (Permanent non-tidal, fast, turbulent watercourses of montane to alpine regions with moss communities) may be related as segments of the same stream or river. These stretches of rivers are usually natural and unaltered. The natural hydrological regime is variable, alternating periods of low water level (but never completely dry) and floods. This regime promotes a cyclic development of the vegetation, the coexistence of various microhabitats, the self-purification due to the high oxygen level. This habitat is characterized by patches of stone beds devoid of any plant species, patches of aquatic mosses attached to stones and patches of submerged rooting macrophytes. Characteristic submerged macrophytes are *Potamogeton alpinus*, *P. polygonifolius*, *Ranunculus fluitans*, and *Callitriche hamulata*. Also *Potamogeton pectinatus* occurs in this habitat with long and narrow leaves floating in the water stream, but might be considered as a species that characterizes less optimal circumstances. Once the water become deep and slowly flowing, *Nuphar lutea* and other species of the genus *Potamogeton* become more characteristic. Emergent amphibian plants such as *Berula erecta*, *Apium nodiflorum*, *Hippuris vulgaris*, *Butomus umbellatus*, *Schoenoplectus lacustris*, *Sagittaria sagittifolia* and *Sparganium emersum* can also develop in more shallow and illuminated parts of this habitat. Due to the strong current these emergent plants usually develop in this habitat their submerged growth forms with leaves adapted to the water movement. Usually, vegetation cover of the habitat does not exceed 30% of the total area of a river stretch. The vegetation can include also species with a wide abiotic range such as *Groenlandia densa*, *Zannichellia palustris*, *Myriophyllum spicatum*, *Nuphar lutea*. Species variation is dependent on flow velocity, water depth, sediment type, shading and nutrient richness. Surface water is speedily flowing and rich in oxygen. These are important favorable circumstances for benthonic macroinvertebrates and fish communities.

Indicators of good quality:

- Flow velocity exceeds 0.2 m/sec
- Riverbed is mainly stony, pebbly or gravelly, with few finer sediments (sand)
- No accumulation of fine (silt and clay) and organic sediments
- Hydrological regime is natural as well as morphology is unaltered
- No or limited occurrence of exotic species
- Limited development of emergent species
- No or limited formation of floating mats of organic residuals.

Characteristic species:

Vascular plants: *Ranunculus aquatilis*, *R. circinatus*, *R. trichophyllus*, *R. fluitans*, *R. peltatus*, *R. penicillatus* subsp. *penicillatus*, *R. penicillatus* subsp. *pseudofluitans*, *Berula erecta*, *Butomus umbellatus*, *Callitriche cophocarpa*, *C. hamulata*, *Glyceria fluitans*, *Myriophyllum alterniflorum*, *Potamogeton alpinus*, *P. berchtoldii*, *P. coloratus*, *P. gramineus*, *P. perfoliatus*, *P. natans*, *P. nodosus*, *P. polygonifolius*, *Rorippa amphibia*, *Sagittaria sagittifolia*, *Schoenoplectus lacustris*, *Sparganium angustifolium*, *S. emersum*, *S. erectum*, *Veronica beccabunga*, *V. anagallis-aquatica*.

Bryophytes: *Fontinalis antipyretica*, *F. dalecarlica*, *Hygrohypnum* spp., *Rhynchostegium ripariodes*, *Scapania undulata*, *Sphagnum denticulatum*.

Algae: *Batrachospermum* spp., *Cladophora* spp., *Hildenbrandia rivularis*, *Thorea ramosissima*, *Chantransia* sp., *Lemanea* spp., *Diatoma* spp., *Hydrurus foetidus*, *Bangia atropurpurea*, *Diatoma* spp., *Gomphonema* spp., *Chamaesiphon* spp., *Navicula* spp., *Nitzschia palea*, *Cocconeis* spp., *Spirogyra* spp., *Mougeotia* spp., *Zygnema* spp., *Oocardium stratum*, *Vaucheria* spp., *Audouinella hermannii*, *Heribaudiella fluviatilis*,

Surirella ovata, *Closterium leibleinii*, *Staurastrum punctulatum*.

Lichens: *Dermatocarpon* spp., *Verrucaria* spp., *Porina clorotica*.

Macroinvertebrates: *Turbellaria*, *Hirudinea*, *Mollusca* (e.g. *Ancylus fluviatilis*, *Unio crassus*, *Margaritifera margaritifera*, *Theodoxus fluviatilis*), *Crustacea* (e.g. *Astacus astacus*, *Austropotamobius pallipes*, *Potamon fluviatile*, *Copepoda*, *Gammarus* spp., *Echinogammarus* spp.); extremely developed in this habitat are aquatic insects of the groups *Plecoptera*, *Trichoptera*, *Ephemeroptera*, *Odonata* and *Diptera*.

Vertebrates: fish: *Lampetra fluviatilis*, *L. planeri*, *Coregonus lavaretus*, *Cottus gobio*, *Salmo trutta*, *S. salar*, *Thymallus thymallus*, *Aspius aspius*, *Esox lucius*, *Perca fluviatilis*, *Leuciscus* spp., *Phoxinus phoxinus*, *Barbus* spp.; amphibians: *Rana* spp., *Salamandrina terdigitata*, Reptiles: *Natrix* spp.; mammals: *Castor fiber*, *Lutra lutra*, *Mustela lutreola*; birds: *Cinclus cinclus*.

Classification

This habitat may be equivalent to, or broader than, or narrower than the habitats or ecosystems in the following typologies.

EUNIS:

C2.2 Permanent non-tidal, fast, turbulent watercourses

EuroVegChecklist:

Batrachion fluitantis Neuhäusl 1959

Annex 1:

3260 Water courses of plain to montane levels with the Ranunculion fluitantis

32A0 Tufa cascades of karstic rivers of the Dinaric Alps

Emerald:

C2.18 Acid oligotrophic vegetation of spring brooks

C2.1A Mesotrophic vegetation of spring brooks

C2.1B Eutrophic vegetation of spring brooks

C2.25 Acid oligotrophic vegetation of fast flowing streams

C2.26 Lime rich oligotrophic vegetation of fast flowing streams

C2.27 Mesotrophic vegetation of fast flowing streams

C2.28 Eutrophic vegetation of fast flowing streams

MAES-2:

Freshwater habitat, rivers and lakes, inland surface water (water courses and bodies)

IUCN:

5.1. Permanent Rivers/Streams/Creeks [includes waterfalls]

Water Framework Directive:

R-C3 (Siliceous mountain brooks)

R-E4 (Upland streams)

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?

No

Justification

This habitat is widespread within the Eurosiberian territories in different regions.

Geographic occurrence and trends

EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Austria</i>	Present	unknown Km ²	Decreasing	Decreasing
<i>Belgium</i>	Present	75 Km ²	Stable	Decreasing
<i>Bulgaria</i>	Present	10 Km ²	Decreasing	Decreasing
<i>Croatia</i>	Present	10 Km ²	Decreasing	Decreasing
<i>Cyprus</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Czech Republic</i>	Present	5 Km ²	Decreasing	Decreasing
<i>Denmark</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Estonia</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Finland</i>	Aland Islands: Uncertain Finland mainland: Present	500 Km ²	Decreasing	Decreasing
<i>France</i>	Corsica: Uncertain France mainland: Present	unknown Km ²	Stable	Decreasing
<i>Germany</i>	Present	325 Km ²	Decreasing	Decreasing
<i>Greece</i>	Crete: Uncertain East Aegean: Uncertain Greece (mainland and other islands): Present	0,23 Km ²	Unknown	Unknown
<i>Hungary</i>	Present	1 Km ²	Decreasing	Decreasing
<i>Ireland</i>	Present	235 Km ²	Decreasing	Decreasing
<i>Italy</i>	Italy mainland: Present Sardinia: Uncertain Sicily: Uncertain	110 Km ²	Decreasing	Decreasing
<i>Latvia</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Lithuania</i>	Present	unknown Km ²	Decreasing	Decreasing
<i>Luxembourg</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Netherlands</i>	Present	0.5 Km ²	Decreasing	Decreasing
<i>Poland</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Portugal</i>	Portugal Azores: Uncertain Portugal mainland: Present	37 Km ²	Stable	Unknown
<i>Romania</i>	Present	0,5 Km ²	Decreasing	Decreasing
<i>Slovakia</i>	Present	4 Km ²	Decreasing	Decreasing
<i>Slovenia</i>	Present	8.68 Km ²	Decreasing	Decreasing

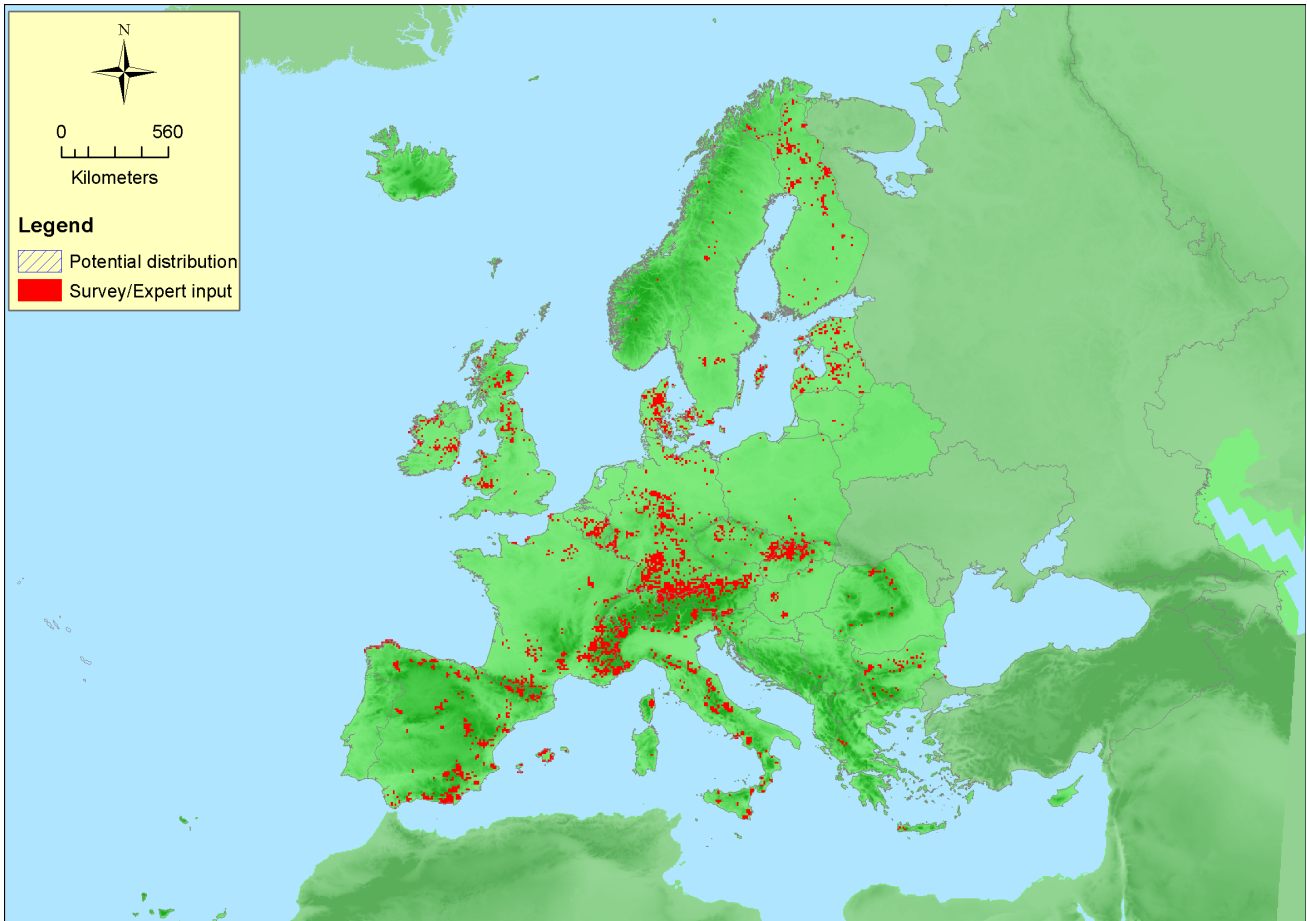
EU 28	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Spain</i>	Spain mainland: Present	30 Km ²	Decreasing	Decreasing
<i>Sweden</i>	Present	unknown Km ²	Unknown	Unknown
<i>UK</i>	Northern Island: Uncertain United Kingdom: Uncertain	unknown Km ²	Unknown	Unknown

EU 28 +	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
<i>Albania</i>	Present	unknown Km ²	Unknown	Unknown
<i>Andorra</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Bosnia and Herzegovina</i>	Present	20 Km ²	Decreasing	Decreasing
<i>Former Yugoslavian Republic of Macedonia (FYROM)</i>	Present	unknown Km ²	Unknown	Unknown
<i>Iceland</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Isle of Man</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Kosovo</i>	Present	unknown Km ²	Unknown	Unknown
<i>Montenegro</i>	Uncertain	unknown Km ²	Unknown	Unknown
<i>Norway</i>	Norway Mainland: Uncertain	unknown Km ²	Unknown	Unknown
<i>Serbia</i>	Present	unknown Km ²	Unknown	Unknown
<i>Switzerland</i>	Present	unknown Km ²	Unknown	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
<i>EU 28</i>	8320300 Km ²	3202	842 Km ²	
<i>EU 28+</i>	9935700 Km ²	3244	862 Km ²	

Distribution map



Map is rather complete, but data gaps exist in the Balkan and probably in Norway. Data sources: EVA, Art17.

How much of the current distribution of the habitat type lies within the EU 28?

It is estimated in one fifth the distribution of the habitat that lies within EU 28.

Trends in quantity

Present past trend in quantity over the past 50 years is a reduction about 44% in both EU 28 and EU 28+ countries. The trends have been calculated from the reported trends by twelve countries (Belgium, Bulgaria, Czech Republic, Germany, Croatia, Hungary, Italy, Ireland, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, Bosnia and Herzegovina). This trend is higher to 50% when the long historical data are taken into account for the countries that provided this data (Austria, Germany and Hungary). The estimated future trend is to decrease in most of the eleven countries, which provided this data.

- Average current trend in quantity (extent)

EU 28: Decreasing

EU 28+: Decreasing

- Does the habitat type have a small natural range following regression?

No

Justification

The habitat has a wide range, covering large parts of the Eurosiberian region although it has undergone an important declining during the last 50 years in the European Union.

- Does the habitat have a small natural range by reason of its intrinsically restricted area?

No

Justification

The habitat may occur localized in segments but it can also form larger stretches of streams or rivers.

Trends in quality

The extent of degradation is 63% and the severity of degradation is 49 for both EU 28 and EU 28+. The trends have been calculated from the reported trends in quality (extent and severity) by 9 countries (Belgium, Bulgaria, Croatia, Germany, Finland, Netherlands, Slovakia, Slovenia and Spain).

- Average current trend in quality

EU 28: Decreasing

EU 28+: Decreasing

Pressures and threats

The modification of the natural hydrographic conditions and the pollution to surface-and groundwaters are the most significant and extended threats affecting the habitat in the EU. Human induced changes in hydraulic conditions include different modifications such as: water reservoir constructions, removal of sediments, modification of structures of water courses, banks protection, dredging and gravel mining. Other cited pressures for this habitat type are related to: the occurrence of invasive non-native species, fishing, biological resources uses, and forest plantation on river banks.

List of pressures and threats

Sylviculture, forestry

Forest and Plantation management & use

Mining, extraction of materials and energy production

Mining and quarrying

Sand and gravel extraction

Pollution

Pollution to surface waters (limnic, terrestrial, marine & brackish)

Pollution to groundwater (point sources and diffuse sources)

Invasive, other problematic species and genes

Invasive non-native species

Natural System modifications

Human induced changes in hydraulic conditions

Removal of sediments (mud...)

Modification of hydrographic functioning, general

Modifying structures of inland water courses

Reservoirs

Small hydropower projects, weirs

Conservation and management

For conservation and management of this habitat type the natural hydrological regime must be maintained including flow velocity, riverbed composition of coarser substrates without accumulation of finer and organic sediments. Water quality must be preserved by controlling and limiting water pollution. Fishing and forest plantation on river banks must be managed. The crops should be maintained at a distance from the river banks in order to maintain a filter vegetation belt against pollutants. No or limited occurrence of exotic species should be maintained.

List of conservation and management needs

Measures related to agriculture and open habitats

Other agriculture-related measures
Adapting crop production

Measures related to forests and wooded habitats

Restoring/Improving forest habitats
Adapt forest management

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality
Restoring/Improving the hydrological regime
Managing water abstraction

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in limnic systems

Measures related to urban areas, industry, energy and transport

Urban and industrial waste management

Conservation status

Annex I:

3260: ALP U1, ATL U2, BLS U1, BOR U2, CON U1, MED U2, PAN U1, STE FV

32A0: no data reported yet

When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

When severely damaged, the specific resources and actions required to recover the habitat should be based on restoring of both the hydrological regime and water quality. If the substrate composition has been altered, it should be reconstructed.

Effort required

10 years	20 years	50+ years
Through intervention	Through intervention	Naturally

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	-45 %	unknown %	unknown %	unknown %
EU 28+	-44 %	unknown %	unknown %	unknown %

Values for A1 were calculated from territorial data sheets. Information is based on 14 (EU 28) and 1 (EU 28+) countries. Most of the countries reported a decreasing trend in the present past quantity which is overall of 45% from EU 28 and 44% from EU 28+. The highest decreasing trends for this habitat were reported from central European countries (Netherlands 75%, Germany 50-80%, Hungary 40-80%) during the last 55 to 65 years. A decreasing long historical trend is indicated for most of the seven countries which reported this information, but a calculation was not possible due to the lack of quantitative data.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50000 Km ²	Yes	Yes	No	>50	Yes	Yes	No	No
EU 28+	>50000 Km ²	Yes	Yes	No	>50	Yes	Yes	No	No

The EOO and AOO are far beyond the thresholds for criteria under B, and therefore other subcriteria for B are not relevant for the conclusion. The habitat is Least Concern according to this criterion.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	63 %	49 %	unknown %	unknown %	unknown %	unknown %
EU 28+	63 %	49 %	unknown %	unknown %	unknown %	unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

The overall extent and severity are the weighted average calculated from reported data from nine EU 28 countries. There is an overall decrease in quality affecting 63% of the surface with an overall severity of 49. The involved countries could not provide any information on long historical or future trends in quality (CD2, CD3, C2, C3, and D2). The changes in quality are both abiotic (waste, trampling) and biotic (invasive species, changes in species composition), so C/D1 has not been split into C1 and D1. Applying the C/D1 criterion the habitat shows a decline close to intermediate threshold affecting more than 50% of the extent, which leads to a Near Threatened status but very close (for only 1 point) to Vulnerable.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	Unknown
EU 28+	Unknown

There is no quantitative data available to estimate the probability of collapse of this habitat type.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	VU	DD	DD	DD	LC	LC	DD	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	VU	DD	DD	DD	LC	LC	DD	NT	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Vulnerable	A1	Vulnerable	A1

Confidence in the assessment

Medium (evenly split between quantitative data/literature and uncertain data sources and assured expert knowledge)

Assessors

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